

**PATENT COOPERATION TREATY**

From the  
**INTERNATIONAL SEARCHING AUTHORITY**

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REC'D 06 JAN 2005

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

**04 JAN 2005**

Applicant's or agent's file reference

020354079P2P

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

PCT/US04/31365

International filing date (day/month/year)

24 September 2004 (24.09.2004)

Priority date (day/month/year)

13 February 2004 (13.02.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): C02F 5/14 and US Cl.: 210/699

Applicant

GENERAL ELECTRIC COMPANY

1. This opinion contains indications relating to the following items:

- |                                     |              |  |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the opinion   |
| <input type="checkbox"/>            | Box No. II   | Priority   |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability   |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited  |
| <input checked="" type="checkbox"/> | Box No. VII  | Certain defects in the international application   |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application  |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/31365

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- a sequence listing  
 table(s) related to the sequence listing

b. format of material

- in written format  
 in computer readable form

c. time of filing/furnishing

- contained in international application as filed.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
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International application No.  
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**Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <u>6, 9-11, and 13-15</u>	YES
	Claims <u>1-5, 7, 8, and 12</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-15</u>	NO
Industrial applicability (IA)	Claims <u>1-15</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and explanations:**

Claims 1-5, 7, 8, and 12 lack novelty under PCT Article 33(2) as being anticipated by Becker 4,446,028. It is submitted that Becker disclose (see col. 2 line 3 through col. 5 line 56) a method of inhibiting scale formation in a desalting or desalination system as recited in the instant claims.

Claims 1, 2, 5, 7, 8, and 12 lack novelty under PCT Article 33(2) as being anticipated by Becker 4,446,026. It is submitted that Becker disclose (see col. 2 line 3 through col. 5 line 13) a method of inhibiting scale formation in a desalting or desalination system as recited in the instant claims.

Claims 6, 11, and 13-15 lack an inventive step under PCT Article 33(3) as being obvious over Becker (028) or Becker (026) in view of Hodgson et al. 4,204,953. The claims differ from the references as applied above by reciting the addition of a polymaleic acid or anhydride, and the inhibition of magnesium hydroxide scale. Hodgson et al. disclose (see col. 1 line 14 through col. 4 line 56) that it is known in the art to add polymaleic anhydrides to saline water evaporators to inhibit scale deposition including magnesium hydroxide. It would have been obvious to one skilled in the art to modify the references as applied above, by addition of polymaleic anhydride in view of the teachings of Hodgson et al., to aid in inhibiting scale deposition including magnesium hydroxide in the desalination system.

Claims 9 and 10 lack an inventive step under PCT Article 33(3) as being obvious over Becker (028) or Becker (026) in view of Bendiksen et al. 5,087,376. The claims differ from the references as applied above by reciting that the phosphonate polymer is poly(vinylphosphonic acid). Bendiksen et al. disclose (see col. 3 line 13 through col. 4 line 43) that it is known in the art to add a polymer of vinyl phosphonic acid to inhibit scale deposition including magnesium salts in aqueous desalination systems. It would have been obvious to one skilled in the art to modify the references as applied above, by addition of poly(vinylphosphonic acid) in view of the teachings of Bendiksen et al., to aid in inhibiting scale deposition in the desalination system.

Claims 6, 9-11, and 13-15 meet the criteria set out in PCT Article 33(2), because the prior art does not disclose a method of inhibiting scale formation comprising the method steps recited in the instant claims.

Claims 1-15 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry to inhibit scale formation in desalination systems.

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**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof: In the description on page 6 last line, "100,00" is erroneous.

**WRITTEN OPINION OF THE  
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International application No.

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**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claim 9 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claim is indefinite for the following reason(s): In claim 9 line 1 "8" appears to be erroneous, and should be changed to - 7 -. It is further noted that poly(vinylphosphonic acid) as recited in claim 9 does not appear to be included in the structure recited in claim 7.